

## REPORT ON THE JANUARY, 1912, FRESHET IN THE WILLAMETTE RIVER.

The Willamette River began to rise rapidly on January 7 and 8. The rainfall in the upper valley caused a sharp rise in the upper Willamette, and the increased discharge was accentuated near the junction with the Columbia River by the thaw in the lower part of the valley. Above Salem there was scarcely any snow on the ground at the time the rains began, but the lower valley was covered to the banks of the river with snow and ice varying in depth from 1 to 6 inches. This was soon turned into water with the change of weather from cold to warm and from snow to rain. Fortunately the thaw did not reach to high elevations, but affected only the snow that had accumulated on the floor of the valley and in the low foothills.

As the river continued to rise, twice-daily observations were called for on January 8 from all river stations in the watershed. Here a difficulty was encountered, for the recent ice storm had demoralized the telegraph service connecting Portland with points in the Willamette Valley, so that the first warning issued, that of January 8, simply advised merchants to be prepared to move endangered goods on short notice, stating that a definite forecast could not be made on account of lack of reports from upriver stations. Warnings were issued daily thereafter and were phrased more definitely as more reports became available.

The water began to fall on the 7th and 8th at the upriver points, where the rainfall was lighter. At Portland the river continued to rise until the 10th, when it came to a stand at 9.1 feet. But the cessation of rainfall was brief. General rains commenced again on the 11th, this time lasting longer and melting the snow at much higher elevations than before.

Water rose rapidly in the Willamette and all its tributaries, and the telegraphing of special reports was resumed. Flood warnings were made twice a day and were in great demand, and the number of persons who consulted the office by telephone regarding the progress of the flood was very large. The forecasts of stages were verified to a degree that was very encouraging and won the commendation of everyone. The height of the flood crest at Portland was successfully predicted three days in advance, the maximum stage of 17.3 feet occurring on the 16th as expected and differing from the forecast but two-tenths of a foot.

The first warning stating definitely the expected height of the flood crest at Portland was issued Saturday evening, January 13, and read as follows:

The river at Portland will reach a stage of about 17 feet Tuesday afternoon, and it will not go much, if any, higher than that stage, unless the rainfall is heavier than expected during the next 48 hours.

The warning was not changed in substance until Monday morning, when the highest expected stage was placed at 17.5 feet.

Special warnings were sent to Salem and Albany on Saturday morning. These were verified as to time of occurrence of the highest water, but were not so accurate in anticipating the height of the flood crest as were the warnings for Portland, the water not going quite so high as expected.

The river was above the flood stage at Portland for three days, from the 15th to the 17th, inclusive. The damage from the flood was slight, and this was undoubtedly due to the timely warnings given by the Weather Bureau. Much perishable stuff on the Portland docks had to be moved to places of safety, and many cellars were flooded, but no property was lost or injured.

Some unavoidable loss and inconvenience was caused in the upper valley and in tributary watersheds. Streams were out of their banks and bridges were carried away in places. The river observer at Jefferson, on the Santiam River, reported as follows:

The last rise in the Santiam River has done lots of damage. It has taken out the North Santiam Bridge, called Greens Bridge; also Thomas Creek Bridge. The lowlands were all under water. Farmers have to go a roundabout way now to get to Jefferson on account of the bridges being out.

The following table gives the morning and evening stages of the streams at all stations in the Willamette drainage area during the period of the freshet. Another table herewith gives a list of 31 winter freshets in the Willamette River and dates of their occurrence.

Daily stages during the Willamette River freshet, Jan. 8 to 19, 1912.

Date.	Eugene.	Harrisburg.	Albany.	Salem.	Wilsonville.	Oregon City.	Portland.	Jefferson.	McMinnville.	Tualatin.	Cazadero.
6 a. m.	5.5	2.3	5.7	4.9	7.9	55.0	3.2	3.5	8.8	.....	2.0
7 a. m.	11.6	6.7	7.7	8.8	13.4	57.5	4.7	9.0	21.0	.....	4.4
8 a. m.	11.0	9.6	13.8	13.6	18.3	59.5	6.3	8.0	28.2	6.1	3.0
8 p. m.	.....	.....	14.4	13.8	18.6	60.0	.....	7.0	.....	.....	.....
9 a. m.	8.9	7.2	16.5	14.1	20.6	60.4	7.6	6.6	26.7	6.3	3.0
9 p. m.	9.5	7.4	15.5	14.2	21.0	60.6	8.1	7.2	.....	6.7	4.1
10 a. m.	8.9	7.9	14.4	14.5	21.5	60.8	9.1	7.8	25.5	7.1	4.5
10 p. m.	.....	7.3	14.6	14.4	.....	60.9	9.6	7.5	25.0	7.1	4.1
11 a. m.	8.6	6.5	14.3	13.7	21.5	60.9	9.1	6.4	24.0	7.0	3.6
11 p. m.	.....	.....	.....	.....	.....	60.6	.....	.....	.....	.....	3.3
12 a. m.	8.8	6.0	12.6	12.4	20.8	60.6	9.0	7.2	24.8	.....	7.4
12 p. m.	14.0	8.8	13.0	13.2	21.0	.....	10.3	11.3	.....	.....	12.2
13 a. m.	17.5	12.9	15.8	17.2	22.4	61.1	11.8	15.3	28.0	.....	11.5
13 p. m.	15.5	12.7	18.4	19.6	23.7	61.7	12.8	14.0	31.0	8.8	11.8
14 a. m.	13.5	11.5	24.6	22.5	26.6	62.7	14.5	13.0	32.5	9.1	10.0
14 p. m.	12.0	10.8	26.1	23.7	28.8	63.2	15.4	11.0	33.0	9.3	8.8
15 a. m.	10.0	9.2	25.0	24.7	30.4	63.8	16.3	9.3	32.5	9.9	7.1
15 p. m.	9.8	8.7	.....	23.7	31.5	64.1	16.9	8.5	32.0	10.3	6.7
16 a. m.	10.0	7.9	20.4	21.7	32.0	64.3	17.3	7.8	29.8	10.9	6.0
16 p. m.	.....	.....	.....	.....	.....	.....	17.2	7.5	29.8	.....	.....
17 a. m.	8.5	7.1	15.0	16.4	29.3	63.5	16.3	6.8	22.0	.....	5.4
18 a. m.	7.8	6.2	12.5	12.4	23.3	61.6	13.6	6.1	15.8	.....	5.0
19 a. m.	7.2	5.5	10.6	10.3	18.3	59.6	10.5	5.7	13.7	.....	4.3

Stages reached in 31 Willamette River freshets at Portland, Oreg.

Years.	Date.	Stage.	Years.	Date.	Stage.
1880.....	Jan. 9	15.8	1897.....	Dec. 14	15.1
1881.....	Jan. 16	21.4	1899.....	Dec. 2	15.0
1881.....	Feb. 7	23.6	1900.....	Jan. 17	16.7
1883.....	Feb. 2	16.6	1901.....	Jan. 17	20.9
1885.....	Jan. 9	15.8	1901.....	Feb. 19	14.7
1886.....	Feb. 4	17.1	1903.....	Jan. 28	19.2
1887.....	Feb. 1	15.8	1904.....	Mar. 11	15.5
1888.....	Feb. 1	16.6	1906.....	Nov. 18	16.0
1890.....	Feb. 6	28.4	1907.....	Feb. 8	22.5
1893.....	Dec. 4	18.7	1907.....	Dec. 28	17.3
1894.....	Jan. 18	19.5	1909.....	Jan. 22	20.5
1894.....	Mar. 19	18.0	1909.....	Nov. 26	22.3
1895.....	Jan. 14	15.9	1910.....	Mar. 5	19.6
1896.....	Jan. 23	20.5	1911.....	Jan. 20	15.4
1896.....	Nov. 19	20.2	1912.....	Jan. 16	17.3
1896.....	Dec. 15	15.2			